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AGENCY FOR INTERNATIONAL DEVELOPMENT
Santo Domingo, Dominican Republic

UNITED STATES GOVERNMENT
**MEMORANDUM**

**Date:** October 13, 1993

**From:** Odalis Perez, Acting TIO Chief

**To:** Project Committee and the Files

**Subject:** Project Assistance Completion Report for On-Farm Water Management Project (517-0159)

This report documents the final status of the subject project as of the Project Assistance Completion Date (PACD), March 30, 1993.

I. Brief Project History

The On-Farm Water Management (OFWM) Project was authorized on June 30, 1983, as a US$12.0 million loan to the Government of the Dominican Republic (GODR). The counterpart requirement for the project was established at RD$29.6 million. The original PACD of September 30, 1988 was extended two years by the Mission to September 30, 1990 and then 30 months by the Assistant Administrator, LAC, to March 30, 1993. In addition to extending the period of the project by 30 months, the Assistant Administrator also approved the Mission's plan to extend the technical assistance contract with Utah State University (USU) for the same period.

On October 1991, USAID/DR received a Congressional notification from USAID/W (SecState 347943) to deobligate all unliquidated funds from FY83 and prior as of 9/30/92. Loan funds were reconciled with AID/W and US$ 1,970,071.99 was decommitted and deobligated. The Loan obligation was amended from US$12.0 million to U$10,029,927, and a Grant for US$848,758 was obligated to cover valid commitments as of 9/30/92.

The project purpose was to strengthen the capability of the GODR to: a) effectively plan the development of its water resources for irrigation; b) plan and operate irrigation systems effectively and efficiently; c) support increased agricultural productivity under irrigation; and d) prevent and/or correct the deterioration of land resources presently under irrigation.

The National Institute for Hydraulic Resources (INDRHI) was the GODR water authority responsible for implementing the project. Technical assistance was provided by Utah State University (USU), a Title XII university. Project activities were carried out in the YSURA and PRYN-I irrigation districts located in the southwest and northwest regions of the country, respectively.

In 1986, the Annex I Project Description of the Loan Agreement was revised to refocus project activities and to place greater emphasis on transferring the operation and maintenance of the irrigation systems to water user associations.

The project was evaluated in February, 1990. The evaluation indicated that the project has been very successful in attaining planned objectives. The successful transfer of the management of the two large GODR-managed irrigation systems of YSURA and PRYN-I to private groups organized in water user associations characterized the project as both unique and world class. Although planned implementation targets were attained, the evaluation team recommended the associations and participating small farmers receive advisory support during the 30-month extension to assist them towards the goal of financial self-sufficiency.

Therefore, the AID/USU contract was amended on May 9, 1991, to extend the contract to 30 March, 1993, and to modify the Statement of Work. The technical assistance provided under the contract amendment was to provide advisory support to the Water User Associations to enable them to become financially self-sufficient. To fulfill this goal, the following objectives were to be attained:

Objectives

1. Raise the water use fee to a level that will ensure the financial self-sufficiency of the water user associations without sacrificing system maintenance;
2. Insure that the Water User Associations are provided with the heavy equipment required in the two irrigation systems;
3. Continue minor construction and rehabilitation works in both irrigation systems with concentration on the termination of drainage infrastructure and the reclamation of land that is not currently productive;
4. Provide management training to technicians and representatives of the water user associations;
5. Improve the legal status of the water user associations.

The project was evaluated again in March, 1993. Substantial progress had been made in achieving all five of the stated objectives. The specific progress of each objective is listed below:

1. Despite efforts to realize the first objective, a prolonged, severe drought nationwide, affecting both YSURA and PRYN-I, and a white-fly infestation in the southwest, affecting YSURA, resulted in decreased crop production. The annual target water fee per tarea had been defined as RD$23.95 for YSURA and RD$29.31 with annual adjustments for inflation. This target fee, due to the serious problems mentioned, was not able to be met. The fee in YSURA is RD$16.01 (credit for labor in canal maintenance is RD$6.00 per tarea). The fee in PRYN-I is RD$20.00.

2. Heavy equipment was transferred to the Juntas de Regantes (Water User Associations), meeting the second objective. In order to meet the third objective in YSURA, the heavy equipment transferred to the water user association was used for the reclamation work (described below).

3. The third objective was amply met. A large area, more than 1200 hectares, where land was out of production due to high water table levels, was reclaimed. Reclamation of the lower part of Sub-lateral #1 has resulted in the environmental improvement of the village of Los Negros and the rural settlements of 2-C in the Azua Valley. Drainage and lowering of the water table has resulted in better living conditions for this population through reduction of disease, improved sanitation, and decreased contamination of ground water.

4. The fourth objective was met. Short-term services of three technicians were provided by USU in: 1) automatic weather stations and irrigation scheduling; 2) reduction of irrigation water losses and appropriate technology; and 3) farmer training aids primarily in video editing technology.

5. Improvement of the legal status of water user associations (WUAs) has been placed high on the government agenda. Recent statements in the press by the INDRHI Director confirm his stated plan to extend the WUA concept throughout all irrigation districts of the DR and turn over control of all irrigation districts to these WUAs.

Furthermore, Title X of a proposed water code being prepared for submission to the legislature specifically declares that all the irrigation districts constructed by the GODR be turned over to the WUAs.

It should also be noted that the OFWM Project originally planned for WUAs covering 6.5% of the total irrigated area of the country (YSURA and PRYN). However, at this writing, as a result of the work done by the GODR during the project extension period, WUAs now cover nearly 15% of the total irrigated area of the DR with an expected figure of 50% by the end of 1993. As stated, the final goal is for 100% of the total irrigated area of the DR to be in the hands of the WUAs.

## II. Delivery of Project Inputs

The On-Farm Water Management Project consisted of the following elements: (See I."Brief Project History" of this document for additional loan/grant details.)

| Total Loan Obligation | Loan Expenditures |
|---|---|
| US$ 10,029,927 | US$ 10,029,927 |

| Total Grant Obligation | Grant Expenditures |
|---|---|
| US$ 848,758 | US$ 231,888 |

The final invoice is pending awaiting invoice for packing and shipping of personal effects of Utah State University contractor.

## III. Counterpart Contribution

The counterpart contribution was less than originally established:

| Planned | Actual |
|---|---|
| DR$ 29.6 million | DR$ 21,038,046 |

RD$6.4 million was disbursed by INDRHI. Counterpart funds were budgeted for direct costs, operations and maintenance, capital investments in parts and equipment, administrative costs, evaluation, training, technical assistance, credit, and for inflation and contingencies.

The last report of counterpart expenditures shows that the amount of the GODR budget for activities of WUAs in 1993 was

US$967,361. Separate GODR funds for continuing the work of the Project in reclamation of the 2-C area of the Azua Valley amounted to DR$12 million; this amount has been

disbursed. For improvement in the PRYN area, DR$14,102,390 has been budgeted. Since these counterpart expenditures cover a period which extends beyond the PACD, this GODR commitment is of serious, positive significance.

## IV. Project Accomplishments (EOPS)

The following table shows the status of the various EOPS outputs at the end of the project:

| | Planned: | Actual: |
|---|---|---|
| 1. Water Users Associations(WUAs) | | |
| In the Project area itself: | 10 | 12 |
| (% of total irrigated area of DR under WUAs | 5.4% | 6.5% |
| Elsewhere throughout DR: | 0 | |
| Already in existence: | | 6 |
| (% of total irrigated area of DR under WUAs | 0% | 15% |
| Being planned as result of OFWMP: | | 100% |
| 2. Physical-Structural Work: | | |
| Irrigation canals rehabilitated: | 306.5 km. | 160 km. |
| Drainage canals reclaimed: | 210.1 km. | 400 km. |
| 3. Results of Physical-Structural Work: QUANTIFIABLE * : | | |
| On-Farm irrigation efficiency increased to range of 45-50%: | 1,150 ha. | 2,000 ha. |
| Hectares leveled: | 1,150 ha. | 2,000 ha. |
| Farm hectares benefitting with: | | |
| Drainage (new): | 1,150 ha. | 2.300 ha. |
| Drains (km.): | 100 km. | |
| Open drains (km.): | | 40 km. |
| Subsurface drains(km): | | 80 km. |
| Irrigation (new): | 1,150 ha. | 1,500 ha. |

| | | | |
|---|---|---|---|
| 4. | Training: | | |
| | Farmers: | 5,000 | 6,500 |
| | As result of OFWMP, total farmers, including outside OFWMP area: | | 7,500 |
| | Off-shore: | 40 | 75 |
| | Degree training: | 26 | 25 |

*5. NON-QUANTIFIABLE RESULTS:

Privatization of control of irrigation districts
Democratic initiatives through WUAs
Security in investment by farmers through perceived decreased risk
Social peace and justice through resolution of conflicts through WUAs
Halting and reversal of land degradation and loss/misuse of soil and water resources
Decreased health risks to rural populations due to draining of waterlogged lands
Decreased risks of loss of homes, critical highways (Puerto Viejo-Los Jovillos, Azua) in times of heavy rains/hurricanes due to construction of adequate drainage systems.
Improved farmer/rural population morale

V. Other Accomplishments and Overall Status

Both the project purpose and the project goal, "To develop the human resources and the institutional conditions necessary for increased productivity in irrigated agriculture", have been achieved. Despite the achievement of increased production and income levels of the farmers in specific areas of project, a 1993 project evaluator opined that because of a weak marketing structure for agricultural commodities and a deficient production credit, the goal "To increase the income and standard of living of Dominican farmers by increasing their productivity" is outside the project's influence. However, he acknowledges that farmers directly associated with the project and those who will be reached as the project concept is replicated nationwide will be more productive.

With the cooperation of the technical assistance group and project personnel, INDRHI continued efforts to replicate the project throughout the country. The INDRHI 1993 budget of nearly US$1 million is considered a significant support for the project after PACD, and will allow the turnover of 29 irrigation systems (417,439 tareas - 26,300 hectares) to 7,261 farmers organized in water user associations. To

support these plans, INDRHI recently inaugurated the National Center for Training in Irrigation and Drainage at Bani, which will provide an excellent means for disseminating the lessons learned under the project to larger audiences.

The Water User Associations, in their role of representing farmer interests to attain their objectives and goals, have grown in maturity and initiative. They are recognized by national organizations, PVOs and donor organizations as the accepted means for channeling resources and services to associated farmers. Examples: the Agricultural Bank extended emergency credit through the YSURA; the Peace Corps public health units make community contacts through the Associations; and TA donors from Germany and Taiwan discovered that the Associations make it easier for them to extend their services to those farmers who can make the best use of their assistance.

## VI. Progress Towards Achievement of Project Purpose

The original project purposes were amply achieved. Institutional goals were fully achieved; physical-structural works and non-structural achievements surpassed those planned.

## VI. Project Design Adjustments

A 1986 change in project focus and strategy resulted in a shift in project priorities to promote rapid development of WUAs and distribution system turnover to water users. Written project objectives did not change.

## VII. Requirement for Continued Monitoring

There is no requirement for continued USAID monitoring of project activities since all such activities have either terminated or have been continued under the extrapolation of successful Project work of turning over control of the irrigation systems to local WUAs being done unilaterally by the National Institute for Hydraulic Resources (INDRHI) throughout the Dominican Republic in all irrigation districts.

However, of most urgent concern is the degree of land degradation: waterlogging and salinity of soils. Between 52 to 58% of the land under irrigation in the country shows signs of moderate to extreme levels of land degradation. Problems of water quality accompany land degradation. The

rate of land degradation in the irrigation districts of the country could be higher than the rate of new irrigated land incorporated to production.

Verification and monitoring of these phenomena is highly recommended and should receive very high priority.

## VIII. Requirement for Further Data Analysis or Evaluation

Since all project activities have terminated or have been continued under the administration of the National Institute for Hydraulic Resources (INDRHI), there is no further requirement for data analysis or evaluation.

## IX. Summary of Lessons Learned

At the request of INDRHI, the On-Farm Water Management Project (OFWMP) came to strengthen the capacity of the GODR in the area of irrigation, as stated in Part I.

At the time of the arrival of the OFWMP to the DR, irrigation and drainage canals in the target zones were filled with plants and some with trees. Administration of the irrigation and drainage systems and operation and maintenance of these had been under the control of the central government through INDRHI. Inefficient water use, along with sporadic/intermittent and unfair water distribution to farmers had resulted in poor crop production which increased poverty, and significantly lowered morale among farmers/water users. Furthermore, misuse of irrigation systems had increased salinity and land degradation problems, further decreasing crop production and farmer morale and increasing poverty.

The OFWMP cleaned, redesigned, and rebuilt irrigation canals and systems and drainage systems. Farmers, once reluctant to let canals be dug through their lands, became eager to cooperate when they saw dramatic increases in crop production on the lands where such canals had been dug. Improved crop production and improved efficiency of water use resulted, with less water being used to serve more land and produce more crops. The improved crop production and water use efficiency led to improved farmer income and desire on their part to maintain the canals and thus their income. The improved physical systems enabled, indeed were essential, to the next step, that of encouraging farmers to organize into water user associations.

In the Water Users Associations the farmers accepted the responsibility for the actual operation and maintenance of the irrigation and drainage systems serving their own lands.

approximate true cost of the water i.e., the operation and maintenance costs of keeping it flowing efficiently and fairly. Farmers began to participate in a democratic manner in decision making which affected themselves.

Success in WUAs has shown farmers that personal investment in democratic processes works, and many WUAs are stimulating other democratic initiatives. Furthermore, some WUAs are serving as bases for empresarial ventures by the farmers themselves.

Privatization of control of irrigation districts through the WUAs within the Project area of influence was so successful that the GODR through INDRHI decided to implement OFWMP methods and procedures to encourage formation of WUAs throughout the country and state its determination to turn all the irrigation districts of the DR over to these WUAs.

Lessons learned include:

1) Top-down, imposed administration of districts and organization into WUAs is not as effective in obtaining farmer cooperation and participation as is bottom-up administration of districts and organization into WUAs done by the farmers/water users themselves.
2) Motivation through clear personal benefits seen was key to encouraging farmer cooperation and participation.
3) Physical, structural works of irrigation, drainage and land reclamation and rehabilitation was essential first of all. If farmers had not seen results and decreased personal risk, they would not have had interest in investing time, money (water tariffs), and cooperation into forming WUAs.
4) Further GODR cooperation and enthusiasm was gained by producing results of improved production and productivity, water use efficiency, and farmer cooperation and organization through both physical-structural actions (irrigation, drainage, land reclamation & rehabilitation) and non-structural actions (efficient management, training of professionals and farmers, and WUA formation).

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